

REMARKS

Claims 1-16 are pending in the application. All of the claims have been rejected. Applicant seeks favorable reconsideration in view of the following remarks.

The Examiner objected to the Abstract. Applicant has amended the Abstract to be in conformance with the appropriate guidelines. Applicant respectfully requests withdrawal of the objection to the Abstract.

The Examiner rejected claims 9-10 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,135,709 (“Stones”). The Examiner asserts that Stones discloses a backing pumping mechanism, a molecular pumping mechanism and a motor for driving the backing pumping mechanism. The Examiner further asserts that Stones discloses a method “comprising using the motor to control rotation of the molecular pumping mechanism thereby controlling pressure in the chamber.” In addition, the Examiner asserts that Stones discloses “a common rotor...coupling the two mechanisms to the shaft, the molecular section..., and the regenerative (backing) section...; so it is inherent that the motor will drive both sections, thereby controlling a pressure in a chamber.” Applicant respectfully traverses the rejection and seeks favorable reconsideration in view of the following remarks.

Independent claim 9 has been amended to claim that the motor is “at least a 2kw motor.” Support for the amendment to independent claim 9 is found in paragraph [0029] of the application as filed. No new matter has been introduced. Applicant respectfully submits that Stones fails to disclose that the motor is at least a 2kw motor as claimed in amended independent claim 9. Indeed, a 200w motor is typically used for a molecular pumping mechanism. ¶ [0029] of the application as filed. In addition, Stones merely discloses that “[t]he shaft 6 is rotatable about its longitudinal axis and is driven by an electric motor 7 surrounding the shaft 6.” Col. 2, Lines 13-14. Stones simply fails to disclose or even suggest a method of controlling pressure in a chamber connected to a vacuum pumping arrangement including a backing pumping mechanism and a molecular pumping mechanism, and at least a 2 kw motor for driving the backing pumping mechanism comprising the step of using the at least 2 kw motor to control rotation of the molecular pumping mechanism as claimed in amended independent claim 9. Accordingly, Applicant respectfully submits that amended independent claim 9 is not anticipated by Stones and requests withdrawal of the rejection to independent claim 9.

The Examiner similarly rejected dependent claim 10 for substantially the same reasons as stated above with respect to independent claim 9. Applicant respectfully submits that dependent claim 10 is not anticipated by Stones for at least the reasons set forth above with respect to independent claim 9. In addition, Stones fails to disclose at least a 2kw “motor to control rotation of the common drive shaft” as claimed in dependent claim 10. Thus, Applicant respectfully submits that Stones fails to disclose each and every element claimed in dependent claim 10. Accordingly, for these further reasons, Applicant respectfully requests withdrawal of the rejection to dependent claim 10.

The Examiner rejected claims 1-4, 6-8, 11-16 under 35 U.S.C. § 103(a) as being unpatentable over Stones in view of U.S. Patent No. 6,739,840 B2 (“Curry et al.”). The Examiner asserts that Stones teaches “a vacuum pumping arrangement for controlling pressure in a chamber, comprising a molecular pumping mechanism, FIG. 3 (50) C.2 Lines 61-63, and a backing pumping mechanism, FIG. 3 (1) C. 2 Lines 5-6, the backing pumping mechanism being rotatable by a motor, FIG. 1 (7) C. 2 Lines 13-15, the motor being arranged to rotate the molecular pumping mechanism simultaneously with the backing pumping mechanism” as claimed in claim 1. The Examiner further asserts that Stones teaches “a common rotor, FIG. 3 (9), coupling the two mechanisms to the shaft, FIG. 1 (6), the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (1) or FIG 3 (1) C. 2 Lines 47-51” as claimed in claim 1. The Examiner argues that “it is inherent that the motor will drive both sections simultaneously.” The Examiner concedes that “Stones does not teach a means of controlling rotational speeds of the mechanisms of claim 1, but Curry does.”

The Examiner asserts that “Curry teaches a control means, FIG. 1 (177) C. 6 Lines 28-33, for controlling rotational speeds of the molecular pumping mechanism...[and] the use of his control means with staged or cooperative pumping arrangements as well.” The Examiner further asserts that “both mechanisms (backing, molecular) are attached to a single shaft and motor so that if one speed is controlled then the other speed must also be controlled. C. 5 Lines 37-57, 50-52.” The Examiner concludes that “[i]t would have been obvious...to combine the control apparatus taught by Curry with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump.” The Examiner further states that “Curry provides motivation in C. 1 Lines 1853.” The Examiner thus asserts that claim 1 is rendered

obvious by Stones in combination with Curry et al. Applicant respectfully traverses the rejection and seeks favorable reconsideration in view of the following remarks.

Applicant has amended independent claim 1 to claim “at least a 2kw motor.” As discussed above with respect to independent claim 9, Stones fails to teach a vacuum pumping arrangement wherein “the backing pumping mechanism is rotatable by at least a 2kw motor” as claimed in amended independent claim 1. In addition, Stones simply fails to teach or even suggest a vacuum pumping arrangement wherein the at least 2kw motor is arranged “to rotate the molecular pumping mechanism *simultaneously* with the backing pumping mechanism” as claimed in amended independent claim 1 (emphasis added). Similarly, nowhere does Curry et al. teach or even suggest a vacuum pumping arrangement having a “backing pumping mechanism...rotatable by at least a 2kw motor, the motor being arranged to rotate the molecular pumping mechanism simultaneously with the backing pumping mechanism” as claimed in amended independent claim 1. Indeed, in applications where it is desirable to achieve vacuum in different pressure regimes, Curry et al. merely teach an arrangement with two independent pumps (i.e. each with its own motor): “a first pump capable of pumping the chamber 150 to a first pressure...and a second pump capable of pumping the chamber 150 to a second pressure...” Curry et al. fail to teach or even suggest a “motor being arranged to rotate the molecular pumping mechanism simultaneously with the backing pumping mechanism and control means for controlling rotational speeds of the backing pumping mechanism *and* the molecular pumping mechanism.” Thus, in view of the foregoing remarks, Applicant respectfully submits that amended independent claim 1 is not rendered obvious by Stones either alone or in combination with Curry et al. Accordingly, Applicant respectfully requests withdrawal of the rejection to amended independent claim 1.

Claims 2-4, 6-8 and 11-16 depend either directly or indirectly from amended independent claim 1. Thus, these claims are similarly not rendered obvious by Stones either alone or in combination with Curry et al. for at least the reasons set forth above with respect to amended independent claim 1.

In addition, regarding dependent claim 2, the Examiner asserts that Stones teaches that “the molecular pumping mechanism and the backing pumping mechanism are driven by a common drive shaft which is driven by the motor” as claimed in dependent claim 2. Specifically, the Examiner identifies “a common rotor, FIG. 1 (9), coupling the two mechanisms

to the shaft, FIG. 1 (6), the molecular section, FIG. 3 (52) C. 2 Lines 65-68, and the regenerative (backing) section, FIG. 1 (9) or FIG 3 (9) C. 2 Lines 47-51. The Examiner concludes that “it is inherent that the motor will drive both sections.” The Examiner thus concludes that dependent claim 2 is rendered obvious by Stones in view of Curry et al. Applicant respectfully submits that neither Stones nor Curry et al. teach or even suggest a molecular pumping mechanism and a backing pumping mechanism driven by a common drive shaft which is driven by a motor where the motor is at least a 2kw motor (see amended independent claim 1). Thus, dependent claim 2 is not rendered obvious by Stones or Curry et al. either alone or in combination. Accordingly, Applicant respectfully requests withdrawal of the rejection to amended independent claim 1.

In addition, the Examiner asserts that Stones teaches that “the molecular pumping mechanism comprises a molecular drag pumping mechanism; FIG. 3 (2) C. 2 Lines 5-8;” as claimed in dependent claim 3 and that “the molecular drag pumping mechanism comprises a Holweck pumping mechanism; FIG. 3 (2) C. 2 Lines 18-25;” as claimed in dependent claim 4. The Examiner further asserts that Stones teaches that “the molecular pumping mechanism comprises a turbomolecular pumping means; FIG. 3 (50) C.2 Lines 61-63” as claimed in dependent claim 6 and that “the backing pumping mechanism is a regenerative pumping mechanism; FIG. 3 (1) C. 2 Lines 5-6;” as claimed in claim 7. The Examiner also asserts that Stones teaches that “the molecular pumping mechanism comprises a turbomolecular pumping means; FIG. 3 (50) C. 1 Lines 27-30” as claimed in dependent claim 11 and that “the molecular pumping mechanism comprises a turbomolecular pumping means, FIG. 3 (50) C. 1 Lines 27-30 and 36-39” as claimed in dependent claim 12. In addition, the Examiner asserts that Stones teaches that “the backing pumping mechanism is a regenerative pumping mechanism; FIG. 3 (1) C. 2 Lines 5-6” as claimed in dependent claim 13 and that Curry et al. teaches that “the backing pumping mechanism is a regenerative pumping mechanism; FIG. 3 (1) C. 2 Lines 5-6” as claimed in dependent claims 15-16. The Examiner concedes that “Stones does not teach a means to control the pump speed...[but that] Curry does.” The Examiner concludes that dependent claims 3-4, 6-7 and 11-16 are rendered obvious by Stones in view of Curry et al.

Applicant respectfully submits that, assuming *arguendo*, even if Stones or Curry et al. teach the above-described elements of dependent claims 3-4, 6-7 and 11-16, the combination would not achieve the invention as claimed in these claims. Neither Stones nor Curry et al. teach or even suggest a vacuum pumping arrangement having a “backing pumping

mechanism...rotatable by at least a 2kw motor, the motor being arranged to rotate the molecular pumping mechanism simultaneously with the backing pumping mechanism; and control means for controlling rotational speeds of the backing pumping mechanism *and* the molecular pumping mechanism” as claimed in amended independent claim 1 from which claims 3-4, 6-7 and 11-16 depend. Accordingly, Applicant respectfully submits that dependent claims 3-4, 6-7 and 11-16 are not rendered obvious by Stones or Curry et al. either alone in combination. Thus, Applicant respectfully requests withdrawal of the rejection to dependent claims 3-4, 6-7 and 11-16.

In addition, the Examiner asserts that Curry et al. further teaches the elements of dependent claims 8 and 14 “wherein the control means, FIG. 1 (177) C. 6 Lines 28-33, comprises means for measuring the pressure in the chamber, C. 3 Lines 63-67, and means for changing the rotational speeds of the molecular pumping mechanism and the backing pumping mechanism, C. 5 Lines 37-57, in dependence on the measured pressure, C. 9 Lines 9-1.” The Examiner concludes that “[i]t would have been obvious...to combine the control apparatus taught by Curry et al. with the Vacuum pump taught by Stones to create a more energy efficient pump as well as a more adaptable pump.” The Examiner cites C. 1 Lines 18-53 as providing the motivation to combine Curry et al. with Stones’. The Examiner concedes that “Stones does not teach a means to control the pump speed.” However, the Examiner asserts that Curry et al. does teach this element.

Applicant respectfully submits that neither Stones nor Curry et al. teach a vacuum pumping arrangement having a “backing pumping mechanism...rotatable by at least a 2kw motor, the motor being arranged to rotate the molecular pumping mechanism *simultaneously* with the backing pumping mechanism” as claimed in amended independent claim 1 from which claims 8 and 14 depend (emphasis added). Curry et al. merely teach an arrangement with two independent pumps (i.e. each with its own motor): “a first pump capable of pumping the chamber 150 to a first pressure...and a second pump capable of pumping the chamber 150 to a second pressure...” Curry et al. fail to teach or even suggest a “means for changing the rotational speeds of the molecular pumping mechanism *and* the backing pumping mechanism in dependence on measured pressure” as claimed in dependent claims 8 and 14 (emphasis added). Thus, Applicant respectfully submits that dependent claims 8 and 14 are not rendered obvious by Stones either alone or in combination with Curry et al. Accordingly, Applicant respectfully requests withdrawal of the rejections to dependent claims 8 and 14.

The Examiner rejected dependent claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Stones in view of Curry et al. as applied to claim 1 above, and in further view of U.S. Patent No. 5,772,395 ("Schofield"). The examiner concedes that Stones and Curry et al. "do not teach a carbon fiber reinforced cylinder for use in the Holweck pump section" as claimed in dependent claim 5. However, the Examiner asserts that Schofield does teach the elements of dependent claim 5. The Examiner asserts that Schofield teaches "a holweck cylinder of the Holweck pumping mechanism is formed from carbon fiber reinforced material; C. 2 Lines 3-6." The Examiner concludes that "[i]t would have been obvious...to use this material in the pump taught by Stones to increase durability and wear resistance while also decreasing weight." Applicant respectfully traverses the rejection and seeks favorable reconsideration in view of the following remarks.


Applicant respectfully submits that, assuming *arguendo*, even if Schofield teaches a holweck cylinder formed from a carbon fiber reinforced material, the combination would not achieve the invention as claimed in dependent claim 5. Neither Stones nor Curry et al. teach or even suggest a vacuum pumping arrangement having a "backing pumping mechanism...rotatable by at least a 2kw motor, the motor being arranged to rotate the molecular pumping mechanism simultaneously with the backing pumping mechanism; and control means for controlling rotational speeds of the backing pumping mechanism *and* the molecular pumping mechanism" as claimed in amended independent claim 1 from which claim 5 depends. Accordingly, Applicant respectfully submits that dependent claim 5 is not rendered obvious by Stones, Curry et al. or Schofield either alone in combination. Thus, Applicant respectfully requests withdrawal of the rejection to dependent claim 5.

In view of the foregoing remarks, Applicant respectfully submits that amended independent claims 1 and 9 and dependent claims 2-8 and 10-16 are neither anticipated nor rendered obvious by Stones either alone or in combination with Curry et al. and/or Schofield. Accordingly, Applicant respectfully requests withdrawal of the rejections to claims 1-16 and that the application be promptly passed to issue.

Applicant has enclosed a request for a three-month extension of time. Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Respectfully Submitted,

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